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WILDFIRE

A STORY OF MODERN FIREFIGHTING

U.S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

PA 993



HIT 'EM HARD AND KEEP 'EM SMALL



PROLOGUE

In the late 1800's the West was being settled, but the country was far from tamed. Man fought man in the pursuit of land, cattle, gold, and a civilized way of life. One by one the problems between men were overcome—peace treaties were signed, range wars were settled, and outlaws were sought by vigilantes and lawmen.

Still many enemies common to all men remained. The Indians and the frontiersmen shared the struggle against the freezing winters of high mountains and the burning droughts of parched deserts; they survived the grasshopper and locust plagues of 1874; they fought fires that raged through acres and acres of grazing land and virgin timber—destroying vast resources that would require years to replenish.

This publication is about the battle against wildfire. Forest Service records describe the large fires of the past and provide an outstanding contrast to modern-day firefighting methods and equipment designed to keep wildfires small. A few survivors from those devastating infernos have told the stories of how poorly-equipped the early day firefighter was to combat wildfire—to "Hit 'Em Hard and Keep 'Em Small."





WILDFIRE

The Year 1871

On Sunday, October 8, 1871, the town of Peshtigo in the North Wisconsin woods lay baked and sultry in the autumn heat, and the air was deathly still. Old-timer John Cameron recalled: "not a crow, not a bird of any kind was heard to call." Over the past 3 months, crews building the North Western railroad nearby had been burning leftover timber, and in the small, quiet town of Peshtigo, every man, woman, and child had eyes streaked with red from the smoke that hung in the still, dry air.

At a little past 9 o'clock that Sunday evening, a low moaning could be heard far off in the timber. It soon became a steady roar, and folks began to emerge curiously from their doors. Suddenly a whirling slab of fire came hurtling out of nowhere and dropped onto the sawdust street. Within moments, a seething, soaring hell broke loose, and a hurricane of fire turned some 700 people to white ash and black cinder.

Old Cameron told of many who fled to the river for sanctuary where some drowned and others lived in spite of the almost boiling water. Three men did seek refuge in a large tank of water, kept as a protection against fire, and there they were boiled alive by the rush of heat and flame that destroyed 2 billion pine trees and a million and a quarter acres.

Peshtigo is a tragic example of an unmanaged fire, completely out of control. There was no

organized force equipped to make an initial attack on the fire and by the time it reached urgent proportions, all that could be done was to allow it to burn itself out.

In all, some 1500 people died in the most calamitous forest fire in American history. The Peshtigo fire went largely unnoticed at the time because the Great Chicago Fire grabbed headlines the next day after flames licked at a stable on De Koven Street and drove people who lived south of the river into panic and some 250 to their deaths.

Although 93 percent of all forest fires today are kept to under 10 acres, we have not seen the end of large fires. Each time certain conditions in the forest occur—dry timber, high temperatures, strong winds, and a small spark—the stage is set for another large fire.

As long as there is fuel to burn, heat for ignition, and air to sustain combustion, man will have fire. How he handles it is the test of his ingenuity, skill, and knowledge.

Since the earliest days, man has fought fires by taking advantage of the slightest rise in humidity or drop in wind speed. He has also used the natural terrain and breaks in timber to stop the onrush of flame. And, the most ancient tools—shovel and axe—together with dirt and water have been used to combat fires for as long as we know.

Still, modern technology has added greatly to effective fire detection and firefighting by providing sophisticated communication systems, lightweight and reliable equipment, dependable ground transportation, and aircraft.



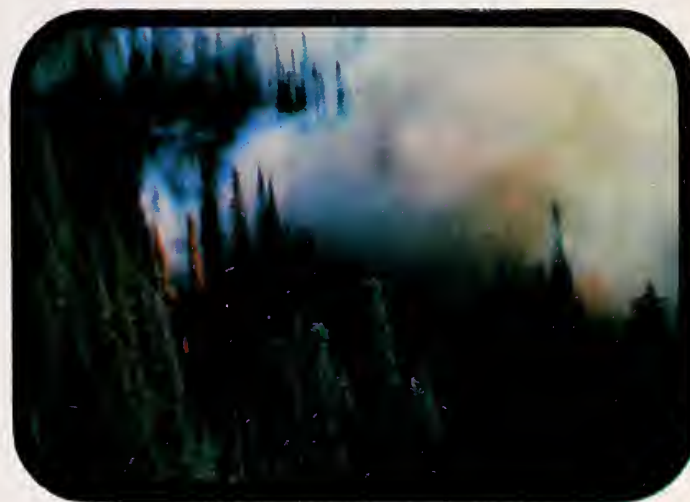
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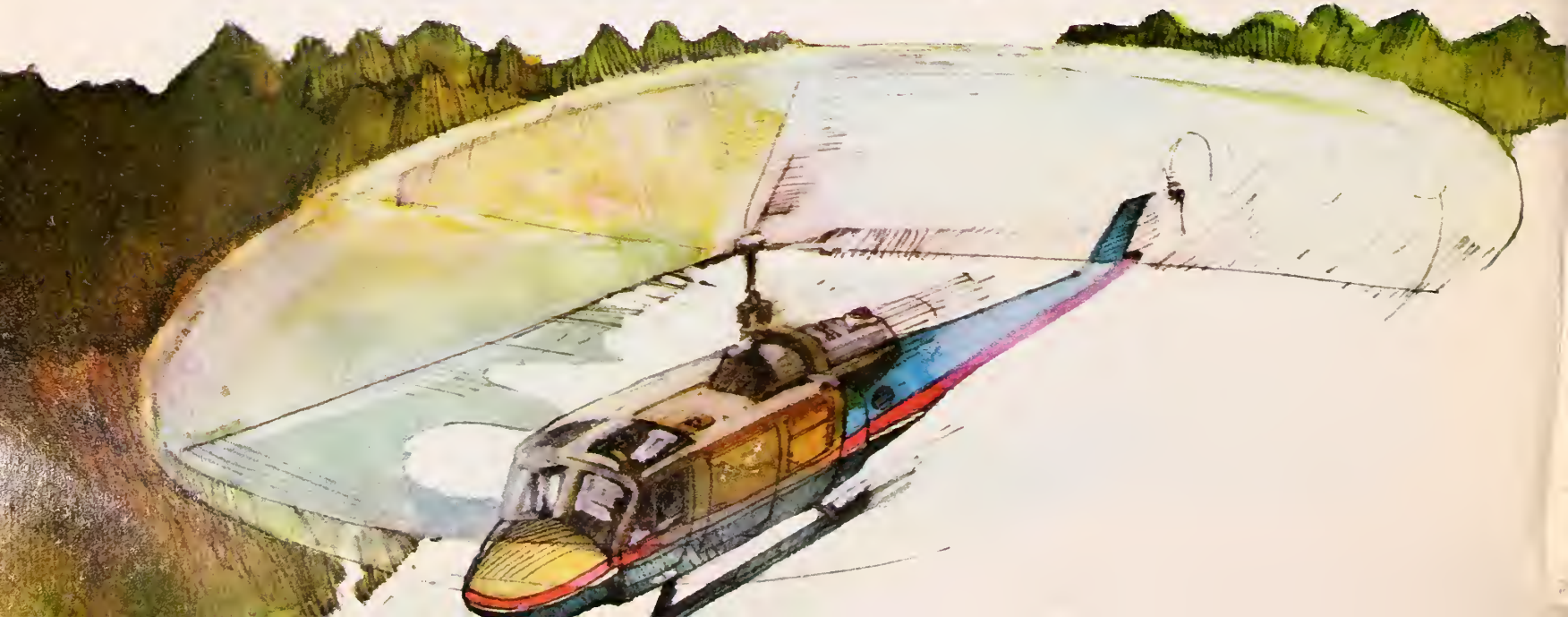
A CENTURY LATER

One of the most spectacular and destructive blazes in recent years occurred in the summer of 1970 in the Pacific Northwest. Lack of rain combined with high temperatures created the most extreme burning conditions in over 30 years, and on August 24 a lightning storm over the State of Washington ignited a string of 54 fires along a 100-mile stretch from the town of Wenatchee up the Columbia River almost to the Grand Coulee Dam.

The combination of record low precipitation, low humidity, high temperatures, and strong winds caused the fires to grow with unheard of speed.

Even before daylight on the morning of August 24, the call went out to the Regional Fire Dispatcher, headquartered in Portland, for men and equipment. Fire troops were mobilized immediately from State forest workers, USDA Forest Service Interregional Fire Crews and employees of other Federal agencies. Eskimos were flown in from the Arctic Circle and veteran Indian firefighters arrived from Arizona and New Mexico. Smokejumpers came from Montana, Idaho, California, Oregon, and Alaska. In all, 270 specially-organized firefighting crews from throughout the nation tackled the roaring inferno which was to be the worst forest fire in the history of the State of Washington.







The fire boss, working with fire control specialists, went to work even before the fire fighting teams arrived. Managing the fire demanded military-like tactics, quick but sure decisions, knowledge of the latest firefighting techniques and equipment, and **SPEED**. This fire required a major campaign, eventually bringing 8,550 trained firefighters to the scene. They had to be fed, housed, transported to problem areas.

Firefighters constructed base camps in only a few hours while men driving tractors built access roads and helicopter landing spots.

Crews were dispatched to construct fireline by clearing brush and grass to mineral soil in a path wide enough to prevent the spread of fire on the ground. Bulldozers did the job that once took many man-hours of labor with shovels. Using

axes and chain saws, men quickly felled trees with overhanging branches or those which might throw sparks across the line.

Four-wheel drive vehicles transported fire fighters through the rugged terrain to put out hot spots sighted from the command helicopter overhead while ground tankers pumped water on accessible areas of the fires.

High winds fanned fire through extremely dry timber, and within the first 24 hours of the campaign, some 40,000 acres were burned—the equivalent of 66 football fields a minute.



Air power was an indispensable help in the campaign. The fire boss called on nearby fire control air bases for support. Within the hour, B-26's and B-17's dropped chemical retardant mixed with water on special problem areas. These military bombers of World War II vintage did much to quench flames and slow the fire's progress by soaking trees and brush with the wet chemicals.



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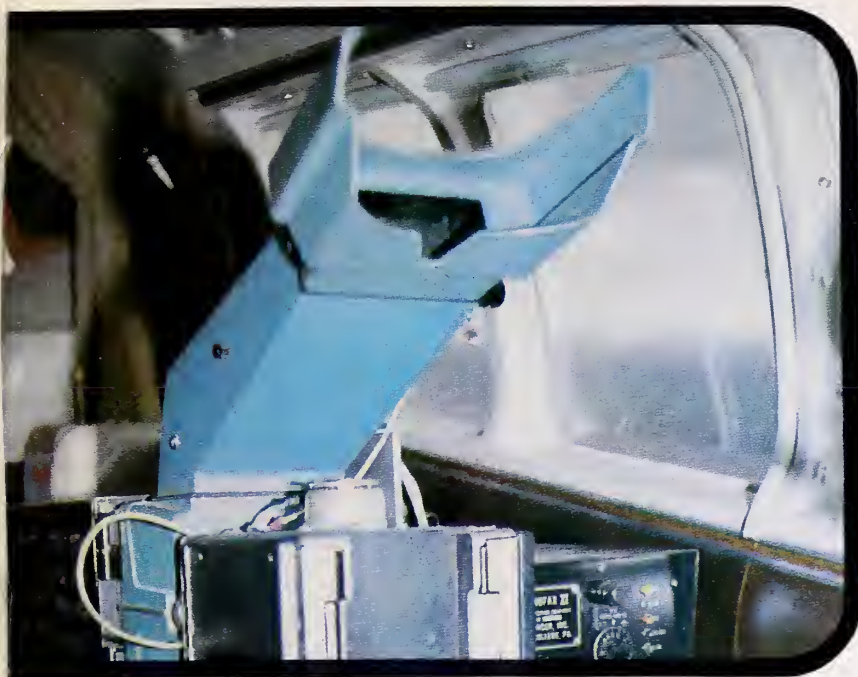


By August 28, only 4 days after the battle had started, a total of 8,108 people were fighting the 226 fires, 26 of which had become large.

The Forest Service's new fire mapper was put to work. These aircraft-mounted infrared sensing units accurately pointed out hot burning areas, spot fires, terrain and cultural features on "thermal pictures" of the fire area. From the plane, the images were transferred to Polaroid film and prints dropped to fire control officers on the ground. These up-to-the-minute recordings of the fire's progress enabled the fire boss to replan strategy to keep ahead of the devastation which continued to sweep across the green mountain-sides.

Mobile weather units were called to the base camp so that the fire boss could be constantly informed on precipitation and wind conditions. No rain was in sight. Radar equipment tracked the dry lightning storms which threatened even more destruction.

In an effort to use all the resources at his command, the fire boss contacted the nearby Northern Forest Fire Laboratory to request that special units seed the gathering thunderhead clouds with silver iodide crystals in the hope of preventing lightning. The Montana facility responded immediately to another chance to test the experimental seeding.



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Calls came into the command center from portable radios on the fireline reporting success at suppressing small fires and requesting help for injured firefighters. The fire boss dispatched helicopters to the steep slopes to hoist the men for a quick trip to care and safety. In other areas, the firefighting "whirlybirds" lowered fresh supplies and new tools to crews laboring in the heat and smoke.

DC-3's and smaller twin-engine aircraft carrying smokejumpers and their 40-pound packs of equipment dropped their valuable cargo into the smoking forest. The jumpers' packs contained firefighting tools, enough food for 2 days and a lightweight, waterproof paper sleeping bag.

Choppers transported specially trained "helitack" crews to fight fires in the most difficult-to-reach areas.



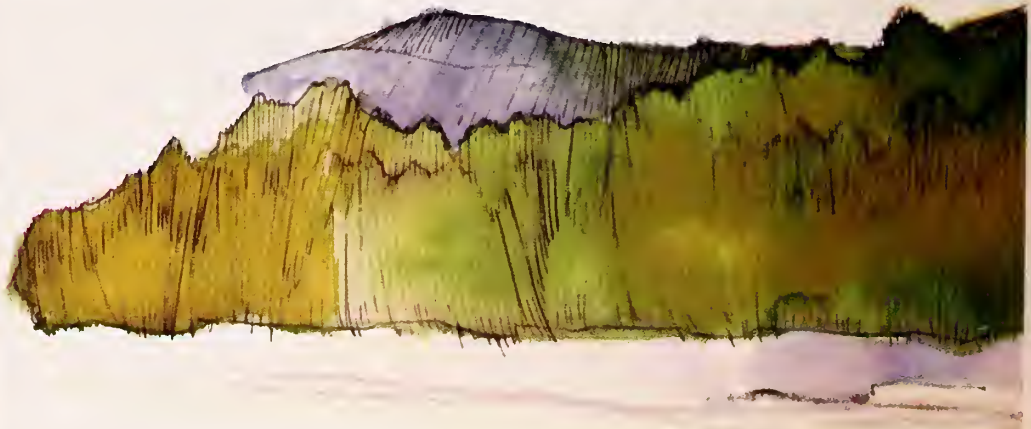




Six days after the fires started, 50 helicopters were in use, providing support services as well as fighting the fires directly. Those choppers equipped with sling buckets were dispatched by radio to mountain lakes where the drumlike buckets were lowered and filled with water. With pin point accuracy, the pilot-bombardiers doused spot fires before they could get out of control.

The fire boss faced extremely tense and difficult situations when fire threatened homes in the Entiat Valley. He was forced to sacrifice hundreds of acres of Douglas fir and Ponderosa pine in order to protect the town. Taking crews from parts of the line where they had been assigned earlier that day, the fire boss positioned them at the edge of the town where they built firelines and started a "backfire" to burn into the onrushing main fire. Local civil defense and rural fire districts aided in the successful protection of lives and valuable property.







Fourteen days after the fires started, they were suppressed by crack firemen, expert in the dirty and dangerous business of firefighting. Without the benefits of modern equipment and technology, this Northern Pacific blaze could have been another Peshtigo.

After the fire was under control, then came the job of mopping up—the hard work of putting out the last hot embers. Modern technology was again called to use with the infrared “hot spotter.” This hand-held device aided in locating still dangerous live coals. The fire boss directed fire scan planes over the area. Flying high above the ground, the scanner reacted to the smallest blazes and pointed out hot spots and endangered areas through the dense smoke. Experts handled spot fires with little effort.

Even before the Entiat fires were stopped, rehabilitation teams prepared maps, examined areas, and determined what must be done to reforest the land. Lumber was salvaged from the burned trees; grass seed and fertilizer were sown by airplane.

In the end, 21 summer homes and several camp grounds were lost to the Entiat Fire. The 2-week inferno claimed 12 million trees on 49,200 acres—enough board feet of lumber to build 21,000 homes. It cost over 4 million dollars to fight the fires which devastated Federal, State and local lands in Washington.



IMPACT

But the destruction waged by fire does not stop with the counting of burned acres and trees. The character of whole forests is changed. When valuable pines and spruces are destroyed, a scrubby growth of inferior species may predominate. Fire scars on the trunks of trees invite wood rot and insects. Fires destroy valuable feed on ranges, and exposure of soil causes erosion and floods.

Fires impair the ability of watersheds to absorb rainfall and hold back runoff, causing pollution of reservoirs, streams, and harbors. Storm runoff is greatly accelerated when fires destroy vegetation on slopes.

Game animals and birds are killed when fire strikes. Water temperatures rise and kill large numbers of fish. Wood ashes washed into streams destroy water life.

Forest fires can ruin tourist and recreation businesses by blackening forests and polluting waters. Services and businesses are disrupted by forest fires when telephone and telegraph lines are destroyed, and when railroad lines and highways are blocked and demolished.





NEW DANGERS

Increased activities in forest areas have added to natural hazards. Every year brings more visitors to forested areas for recreation; residences and summer homes continue to be built where trees abound. Construction and industry in the forests mean the possibility of fires when power lines fall and sparks from power equipment ignite underbrush.

The continuously increasing value of timber as a natural resource has created new conflicts for fire managers. At times, it is necessary to sacrifice hundreds of acres of timber by removing all firefighting resources from heavily forested areas and relocating the effort where homes, campers, and industry are threatened.

For many reasons—effective firefighting, land management, reseeding and regeneration of forests—the Nation enjoys an increase in trees, grass, and other desired vegetation. But this brings with it a dilemma for those who manage the one and a quarter billion acres of National Forest land. The increase in vegetation raises the danger of wildfire.

Good land management recognizes that prescribed burning has long been a leading wildfire prevention technique as well as a beneficial way of eliminating plant diseases and insects and germinating some specific trees to maintain a balance of nature. Forest and land management experts have found that they achieve these beneficial results by applying fire skillfully, under exacting weather conditions in a specific place. Prescribed burning also removes undesirable plants and trees and eliminates heavy accumulations of flammable ground cover, thus reducing the hazard of destructive wildfire.







PREVENTING WILDFIRE

Nine out of every 10 forest fires are man-caused, and today's fire managers require the help of every person in the forest to prevent wildfire by: 1) Guarding against fire escaping from debris burning; 2) putting campfires out cold; and 3) using ashtrays.

Each fire season brings 10,000 new fires—10,000 new challenges for courageous and hardy firefighters to live up to the motto: HIT 'EM HARD, AND KEEP 'EM SMALL.



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